

PhysPAG

31 July 2012
NAC APS Report

S. Ritz

See

<http://pcos.gsfc.nasa.gov/physpag.php>

Includes email sign-up for news and announcements. Reports from previous meetings, links to APS reports, ...

NASA National Aeronautics and Space Administration
Goddard Space Flight Center

- Goddard Space Flight Center
- Sciences and Exploration Division
- Astrophysics Science Division

Physics of the Cosmos

Overview Projects Science Technology Studies Program Office Education

Links

- PhysPAG

Study Analysis Groups (SAGs)

- IPSAG (Inflation Probe SAG)
- GWSAG (Gravitational Wave SAG)
- XRSAG (X-ray SAG)
- GammaSAG (Gamma ray SAG)
- TechSAG (Technology, no longer active as of January 2012)

Physics of the Cosmos Program Analysis Group (PhysPAG)

Objective

The Physics of the Cosmos Program Analysis Group (PhysPAG) serves as a forum for soliciting and coordinating input and analysis from the scientific community in support of the PCOS program objectives. The PhysPAG enables direct and regular communication through public meetings that give the community opportunities to provide its scientific and programmatic input. All interested scientists can contribute to the PhysPAG by participating in the PhysPAG meetings and by providing their input. The Executive Committee (EC) is the steering body of the PhysPAG. Its members are appointed by NASA with the concurrence of the **Astrophysics Subcommittee**, and their responsibilities include collecting and summarizing community input with subsequent reporting to NASA SMD via the **NAC**.

Upcoming Meetings

Fourth Meeting: PhysPAG Meeting 2012

August 14-16, 2012
Holiday Inn Capitol
550 C Street SW
Washington, D.C.

Past Meetings

- **First Meeting of the PhysPAG** — 13 Jan 2011, Seattle, WA
- **Second Meeting of the PhysPAG** — 1 May 2011, Anaheim, CA
- **Third Meeting of the PhysPAG** — 8 January 2012, Austin, TX

PhysPAG Announcements

Sign up for **PhysPAG announcements**.

Executive Committee

Steve Ritz (Chair) - University of California, Santa Cruz
Jason Rhodes - Jet Propulsion Laboratory
Shaul Hanany - University of Minnesota
Jay Bookbinder - Harvard-Smithsonian Center for Astrophysics
Liz Hays - NASA Goddard Space Flight Center
Guido Mueller - University of Florida

Rita Sambruna (Executive Secretary, Ex-Officio) - NASA HQ
Ann Hornschemeier (PCOS Program Office, Ex-Officio) - NASA GSFC

Contact

- **Rita Sambruna**
HQ PCOS Program Scientist
- **Ann Hornschemeier**
PCOS Program Office Chief Scientist

Program News

25 June 2012

Fourth PhysPAG Meeting Breakout Agendas Posted
» [Details](#)

31 May 2012

Euclid Science Team AQ Frequently Asked Questions (FAQ) Now Posted » [Details](#)

23 May 2012

Euclid Science Team Membership (NOI Deadline: June 15, 2012; Deadline: August 31, 2012) » [Details](#)

11 May 2012

IPSAG One-Day Meeting, Aug. 15, 2012, Washington, D.C. » [Details](#) [[PDF](#)]

2 May 2012

Fourth PhysPAG Meeting announced: Aug 14-16, 2012 in Washington, D.C. » [Details](#)

Project News

Chandra News

3 July 2012

X-raying the beating heart of a newborn star. » [Details](#)

Fermi News

26 June 2012

Committee on Space Research Honors NASA's Neil Gehrels for Science Contributions » [Details](#)

Planck News

13 Feb 2012

Planck steps closer to the cosmic blueprint » [Details](#)

XMM-Newton News

21 May 2012

XMM-Newton reveals light 'echo' around supermassive black hole » [Details](#)

Related News

Suzaku News

3 July 2012

X-raying the beating heart of a newborn star. » [Details](#)

Swift News

28 June 2012

Hubble, Swift Detect First-Ever

PCOS Science and Missions

- *Physics of the Cosmos spans the fields of high-energy astrophysics, cosmology, and fundamental physics, and includes a wide range of science goals. These include the following:*
 - **Expand our knowledge of dark energy**
 - **Precisely measure the cosmological parameters governing the evolution of the universe and test the inflation hypothesis of the Big Bang**
 - **Test the validity of Einstein's General Theory of Relativity and investigate the nature of spacetime**
 - **Understand the formation and growth of massive black holes and their role in the evolution of galaxies**
 - **Study the origin and acceleration of cosmic rays**
 - **Particle Signals of Dark Matter**

The screenshot shows the NASA website page for 'Physics of the Cosmos' projects. The page is titled 'Physics of the Cosmos Projects' and features a navigation menu with tabs for OVERVIEW, PROJECTS, SCIENCE, TECHNOLOGY, STUDIES, and PROGRAM OFFICE. The main content is organized into several sections:

- Links:** A list of links including Documents, PhysPAG, COR Program Office, ExEP Office, Multimedia Library, and Sign up for PCOS News and Announcements.
- Operating Missions:** A section listing active missions with images and brief descriptions:
 - Chandra X-ray Observatory:** Launch date: 23 July 1999. <http://chandra.harvard.edu/>. Description: The Chandra X-ray Observatory, a NASA Great Observatory, provides the most detailed view to date of the X-ray universe. With its exquisite imaging capabilities and high spectral resolution scientists have investigated phenomena as diverse as the spectra of Jupiter's aurora, the effects of dark energy on the growth of galaxy clusters, and the properties of faint x-ray sources in deep fields.
 - Fermi:** Launch date: 11 June 2008. <http://fermi.gsfc.nasa.gov/>. Description: The Fermi Gamma-Ray Space Telescope (formerly GLAST) is providing our deepest and most detailed map of the gamma-ray sky. Fermi has recorded high-energy gamma rays produced by supernovae, pulsars, extreme flows of energy from systems powered by black holes, and gamma-ray bursts.
 - Planck:** Launch date: 14 May 2009. <http://www.esa.int/SPECIALS/Planck/>. Description: Planck Surveyor is an ESA-led mission that is making a precise, full-sky map of the Big Bang's cosmic microwave background (CMB). By measuring minute fluctuations in the CMB temperature and polarization at all angular scales, Planck will stringently test the theory of inflation, and will provide the most accurate information to date on the overall composition, shape, and early expansion history of the universe.
 - XMM-Newton:** Launch date: 10 Dec 1999. <http://xmm.esac.esa.int/>. Description: XMM-Newton, the X-ray Multi-Mirror Mission, is the second cornerstone of the ESA Horizon 2000 program. With high collecting area in the x-ray band, XMM provides vital information for studies of fundamental and relativistic processes from neutron stars and active galactic nuclei, the creation and dispersal of the elements in supernovae, the distribution of dark matter in clusters, groups, and elliptical galaxies, and young active stars to constrain models of the early solar system and star forming regions.
- Program News:** A section listing recent news items:
 - 5 January 2012:** Draft Agenda for PhysPAG Meeting at AAS in Austin, Texas, is posted. [» Details](#)
 - 21 December 2011:** X-ray Mission Workshop presentations are posted. [» Details](#)
 - 1 December 2011:** Second Issue of the Physics of the Cosmos Newsletter now available. [» Details](#)
 - 1 December 2011:** PCOS Program Annual Technology Report (PATR) now available. [» Details](#)
- Project News:** A section listing recent project news items:
 - Chandra News 17 November 2011:** NASA's Chandra Adds to Black Hole Birth Announcement. [» Details](#)
 - Fermi News 28 November 2011:** In the Heart Of Cygnus, NASA's Fermi Reveals A Cosmic-ray Cocoon. [» Details](#)
 - Planck News 27 April 2011:** Andromeda's coat of many colours. [» Details](#)
 - XMM-Newton News 7 October 2011:** XMM-Newton AD-11 Solicitation Closed. [» Details](#)
- Related Missions News:** A section listing related mission news items:
 - RXTE News 28 September 2011:** RXTE Special Session at January 2012 AAS Meeting: Abstract Deadline. [» Details](#)
 - Suzaku News 1 September 2011:** Suzaku AD-7 Proposals Due on Nov 10, 2011. [» Details](#)
 - Swift News 25 October 2011:** Now There's an App for NASA's Swift Observatory. [» Details](#)
- Previous Missions:** A section for previous missions.

Executive Committee

- Jay Bookbinder (CfA)
- Shaul Hanany (Minnesota)
- Liz Hays (GSFC)
- Guido Mueller (UFL)
- Jason Rhodes (JPL)
- Steve Ritz (UCSC), chair

PhysPAG is much,
much more than the
EC!

physpag-ec@bigbang.gsfc.nasa.gov

Most Recent Activities

- Interactions with the Project Office on Technology
- Planning for 14-16 August Jamboree in Washington:
 - startup of approved SAGs for X-ray, Gravitational Wave, and Gamma-ray communities and continued work by IPSAG
 - plenary and parallel sessions defined
- Received proposal for a CRSAG
- Planning for meetings in 2013 at AAS, American Physical Society, HEAD...plus presence at smaller topical meetings.

PhysPAG Meeting Block Schedule

104
registered
participants
as of 10 July

14 August	15 August	16 August
8:30 Welcome, PhysPAG intro, plan for meeting 8:45 News from HQ (10+5) 9:00 PCOS program brief (15+5) 9:20 Q&A (10)	8:30-10:30 Dark Energy Focus Topic Plenary	9:00 -10:30 PLENARY REPORTS (20+10 each) • DE, Gamma, IP
9:30-10:00 COPAG Report (20+10)		
10:00-10:30 ExoPAG Report (20+10)		
10:30-11 BREAK	10:30-11 BREAK	10:30-11:00 BREAK
11-12:15 X-ray study results and discussion (45+30)	11-12: Discussions with NASA HQ	11:00-12:00 PLENARY REPORTS continue (20+10) • GW, X-ray
12:15-13:45 LUNCH	12-13:30 LUNCH	12:00-13:00 Further discussions with NASA HQ 13:00 Meeting Wrap-up, Adjourn
13:45-15:00 GW study results and discussion (45+30)	13:30-15:00 Parallel sessions	
15:00-15:30 Opportunities for Cosmic Ray Science (20+10)		Afternoon free for satellite meetings.
15:30-16:00 BREAK	15:00-15:30 BREAK (all groups together)	
16:00-18:00 Parallel sessions start	15:30-18:00 Parallel sessions wrap up	
18:00 adjourn	18:00 adjourn	

PhysPAG August Detailed Agenda

PhysPAG Meeting 2012

Meeting Agenda

- Monday, 14 August
 - 8:30 Welcome, PhysPAG Intro, Meeting Plan - S. Ritz
 - 8:45 News from HQ (10+5)
 - 9:00 PCOS Program Brief (15+5)
 - 9:20 Q&A
 - 9:30 COPAG Report (20+10) - C. Martin
 - 10:00 ExoPAG Report (20+10) -S. Gaudi
 - 10:30 BREAK
 - 11:00 X-ray Study Results and Discussion (45+30) - R. Petre
 - 12:15 LUNCH
 - 13:45 GW Study Results and Discussion (45+30) - J. Livas/I. Thorpe
 - 15:00 Opportunities for Cosmic Ray Science (20+10) - A. Olinto
 - 15:30 BREAK
 - 16:00-18:00 X-ray and GW Parallel Sessions start
 - 18:00 Adjourn

- Tuesday, 15 August
 - 8:30-10:30 Dark Energy Focus Topic Plenary Session:
 - Rachel Bean (via telecon): Dark Energy Overview and the Big Picture (30 mins)
 - Neil Gehrels : WFIRST status update (15 mins)
 - Paul Schechter: WFIRST and Euclid Science (30 mins)
 - David Weinberg: Beyond WFIRST, LSST and Euclid (30 mins)
 - 8:30-10:30 IPSAG Parallel Session
 - 10:30 BREAK
 - 11:00 Group Discussions with Paul Hertz
 - 12:00 LUNCH
 - 13:30-18:00 Parallel Sessions
 - **DE**
 - **IPSAG**
 - **GWSAG**
 - **XRSAG**
 - GWSAG -- No Formal Agenda, White Paper Work Session
 - 18:00 Adjourn

- Wednesday, 16 August
 - 9:00 Dark Energy report (20+10) - J. Rhodes
 - 9:30 GRSAG report (20+10) - E. Hays
 - 10:00 IPSAG report (20+10) - S. Hanany
 - 10:30 BREAK
 - 11:00 GWSAG report (20+10) - G. Mueller
 - 11:30 XRSAG report (20+10) - J. Bookbinder
 - 12:00 Further discussions - HQ, all
 - 13:00 Meeting wrap-up, adjourn

<http://pcos.gsfc.nasa.gov/physpag/meeting-agenda.php>

Breakout Sessions Defined

XRSAG

Tues 08/14 - 14:00 - 15:30 - 1.5 hours

- Detailed update on the Concept Studies & Discussion – R. Petre (45 min + 15)
 - AXSIO, N-XGS, N-WFI, X-CAL, future missions
 - Recommendations from the study
 - Next steps
- Discussion on mission costings – lessons' observed and how to improve the process Daelmans/Bookbinder – (20 +10 min)

Wed 08/15 – 13:30 – 15:00 -1.5 hours

- Update on recent mission activities: Var - (30 min)
 - NuSTAR launch and first results
 - Astro-H status
 - Implications of GEMS cancellation - impact on the science and the communi
- Upcoming instrument/mission flight opportunities - MoO, SMEX, other? Open Discussion (15 min)
- International participations – TBD speaker & Open discussion (20 min)
 - L1 status and process: impact of non-selection of ATHENA & NGO & plan re-submittal
 - developing int'l collaborations - new ideas and approaches.
 - How to partner ESA (junior/senior partner)
 - Potentials for other countries: Brazil, China, India - risks and opportunities

Wed 08/15 - 15:30 – 17:30 -2 hours

- Technology Development planning – var. speakers
 - status of current efforts in optics – 30 min
 - status of current efforts in detectors – 20 min
 - Future needs for tech development – 20 min
 - near term – FY 13, 14
 - far term
 - Developing an integrated technology development plan/roadmap – 20 min
- And other potential sources of funding outside of the traditional (NASA/NSF)

16:00-16:45 The situation in Europe and the rest of the world (Danzmann)

- L1 process:
 - NGO Consortium construct
 - SSAC and SPC decisions
- L2/Cornerstone process:
 - NGO/eLISA Organization in Europe
 - Partnership options for Europe

16:45 - 17:00 Discussion

17:00 - 17:30 Role of the GW-SAG (GM, Someone from PCOS) 30min

- GW-SAG within PhysPAG
 - Depends on existence or non-existence of a Study team at GSFC/JPL and a GW-Science team
 - If GW-SAG is all, do we have to push for an expansion of number of supported people (travel support)?

08/15 Parallel Session GW SAG

13:30 - 15:00 Exploring options for the NASA

- Junior Partner with ESA
- Full partner with ESA
- Doing it alone
- China

in light of expected funding profiles

Different technology programs/plans for different options

- Being aware of ESA's way of doing business.
- How to prioritize technology plans?

15:30 - 17:30 How do we continue?

Wrap up

Physpag Meeting 15 August 2014

DE plenary Session 8:30 AM- 10:30 AM

Rachel Bean (via telecon): Dark Energy Overview and the Big Picture (30 mins)

Neil Gehrels : WFIRST status update (15 mins)

Paul Schechter: WFIRST and Euclid Science (30 mins)

David Weinberg: Beyond WFIRST, LSST and Euclid (30 mins)

Parallel Sessions:

Issues to be considered:

13:30-15:00

Benefit of an IFU on a dark energy mission (Greg Aldering)

Ground based projects (Gary Bernstein)

Computing Needs (Julian Borrill)

15:30-17:30

Technology needs (Jason Rhodes)

2.4M NRO WFIRST, benefits and advocacy (Gehrels and Schechter)

GWSAG

DE Session

Agenda

8:00 – 8:30

Coffee

8:30 – 8:45

Background (15 min) - Hanany

Bring the audience up to speed on recent IP history, decadal panel recommendations, status within NASA HQ, Goals of Workshop.

8:45 – 9:35

Planck (40 min) – Lawrence + Crill
Discussion (10 min)

What have we learned from Planck about technology, foregrounds, calibration and systematics.

9:35 – 10:35

Progress by sub-orbitals:
Balloons (25 min) - Jones
Ground-based (20 min) – Lee
Discussion (15 min)

What progress can we anticipate by sub-orbitals by the time of the mid-decade review? What else do we want to achieve by mid-decade and later in term of sub-orbital experiments?

10:35 – 11:00

Break

11:00 – 12:00

Meeting with Paul Hertz

12:00 – 1:15

Lunch break

1:15 – 2:25

CORE (15 min) - de Bernardis,
EPIC (15 min) - Bock,
PIXIE (15 min) - Kogut,
LiteBIRD (15 min) – Hazumi
Discussion (10 min)

2:25 – 3:20

Technology development
Detector Arrays and Focal Plane Coupling (25 min) - Moseley
Multiplexing (15 min)- Irwin
Discussion (15 min)

What are the key immediate areas for development? Where is the technology heading in the near term (<2015) and mid-term (>2015)?

3:20 – 3:30

Break

3:30 – 4:10

NASA HQ and Program office

IPSAG

...plus GammaSAG
whitepaper organization
session

CRSAG PROPOSAL

Proposal for a Cosmic-ray Science Analysis Group (CosmicSAG)

Angela Olinto and Eun-Suk Seo
June 20, 2012

Goals

- Provide an assessment to NASA HQ and the PCOS program office of the status and the current and future needs of the cosmic-ray astrophysics community.
- Act as a focal point and forum for the cosmic ray community.

CRSAG PROPOSAL

Deliverables

1) White paper:

major open science questions

brief survey of current state-of-the-art capabilities:

current and planned, US and International, space and ground-based
energy coverage: from $\sim 10^8$ eV to above 10^{20} eV

particle types: nucleons, nuclei, anti-nucleons, anti-nuclei, $e^+ e^-$, neutrinos
(energy and sky coverage for each particle type)

Possible leaps in capabilities over the next 10-15 years,

Potential science return corresponding to those capabilities.

Techniques used in each cosmic-ray band for both balloon and satellite platforms.

2) List of **technology development needs** with timelines.

3) Suggestions to help **support the specific needs** of this community: organizational, scientific, funding.

CRSAG PROPOSAL

Timescale

- “June 2012”: open meeting at CR2012 requesting input from the community.
- July 2012 – at COSPAR
- Teleconferences and email input: for further information gathering.
- August - December 2012: compile/write white paper.
- January 2013: Circulate to the community for feedback
- February 2013: Deliver white paper to PhysPAG (+ NAC)
- Present white paper at April 2013 - APS meeting.



Thanks

- *Thanks to all SAG members for their hard work and the PCOS office for their support*

See

<http://pcos.gsfc.nasa.gov/phypag.php>

Includes email sign-up for news and announcements. Reports from previous meetings, links to APS reports, ...

Discussion

- CRSAG proposal
- Feedback on all PhysPAG activities
- ...